

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
30 July 2009 (30.07.2009)

(10) International Publication Number
WO 2009/092383 A3

PCT

(51) International Patent Classification:

A23K 1/16 (2006.01) A61L 2/00 (2006.01)
A23K 1/18 (2006.01) A23L 1/30 (2006.01)
A23C 3/00 (2006.01) A61K 35/20 (2006.01)
A23C 3/08 (2006.01) C07K 16/04 (2006.01)
A23C 9/20 (2006.01) C07K 16/06 (2006.01)
A61K 39/395 (2006.01)

(21) International Application Number:

PCT/DK2009/050016

(22) International Filing Date:

22 January 2009 (22.01.2009)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

PA 2008 00078 22 January 2008 (22.01.2008) DK

(71) Applicant (for all designated States except US): **MULTIMERICS APS** [DK/DK]; Niels Jernes Vej 10, DK-9220 Aalborg Øst (DK).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BISGAARD-FRANTZEN, Kirsten** [DK/DK]; Furesøbakken 13, DK-3460 Birkerød (DK).

(74) Agent: **HØIBERG A/S**; St. Kongensgade 59A, DK-1264 Copenhagen K (DK).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

1 October 2009

(54) Title: PRODUCTS AND METHODS TO PREVENT INFECTION

(57) Abstract: The present invention relates to products and methods for preventing, ameliorating and/or treating infections and other diseases. In one aspect, the products of the present invention relates to compositions comprising germ free colostrum. In another aspect, the products of the present invention relates to compositions comprising synthetically multimerised immunoglobulins. In a third aspect, the products of the present invention relates to compositions comprising germ free colostrum enriched with synthetically multimerised immunoglobulins. The invention also relates to use of said compositions as a pharmaceutical e.g. for prophylactic or ameliorating treatment of infections and other diseases. In addition the invention comprises methods for production of said compositions.



WO 2009/092383 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2009/050016

A. CLASSIFICATION OF SUBJECT MATTER

INV. A23K1/16 A23K1/18 A23C3/00 A23C3/08 A23C9/20
A61K39/395 A61L2/00 A23L1/30 A61K35/20 C07K16/04
C07K16/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A23K A23C A23L A61P A61L A61K C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, FSTA, WPI Data, COMPENDEX, BIOSIS, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SU C-K ET AL: "Extraction of immunoglobulin-G from Colostral whey by Reverse Micelles" JOURNAL OF DAIRY SCIENCE, AMERICAN DAIRY SCIENCE ASSOCIATION, SAVOY, IL, US, vol. 86, no. 5, 1 January 2003 (2003-01-01), pages 1639-1645, XP002986979 ISSN: 0022-0302 abstract; figure 1 ----- -/--	18,21



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

G document member of the same patent family

Date of the actual completion of the international search

29 July 2009

Date of mailing of the international search report

12/08/2009

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Rooney, Kevin

INTERNATIONAL SEARCH REPORT

International application No

PCT/DK2009/050016

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MAINER ET AL.: "Kinetic and thermodynamic properties for heat denaturation of bovine milk IgG, IgA and IgM." JOURNAL OF FOOD SCIENCE., vol. 62, no. 5, 1997, pages 1034-1038, XP002526992 USINSTITUTE OF FOOD TECHNOLOGISTS. CHICAGO. the whole document -----	20
X	PIOT, M. ET AL.: "Preparation of serocolostrum by membrane filtration" LE LAIT, vol. 84, 2004, pages 333-341, XP002526993 PARIS abstract -----	20
X	US 5 147 548 A (HIES HENRY [DE] ET AL) 15 September 1992 (1992-09-15) the whole document -----	20
X	FUKUMOTO L R ET AL: "STABILITY OF MEMBRANE-STERILIZED BOVINE IMMUNOGLOBULINS ASEPTICALLY ADDED TO UHT MILK" JOURNAL OF FOOD SCIENCE., vol. 59, no. 4, 1 July 1994 (1994-07-01), pages 757-759, 762, XP000474124 ISSN: 0022-1147 the whole document -----	20
X	WASHBURN, K. E., ET AL.: "Photodynamic inactivation of an RNA enveloped virus in goat colostrum" SMALL RUMINANT RESEARCH, vol. 42, 2001, pages 31-37, XP002526891 ELSEVIER, AMSTERDAM page 34, column 1, paragraph 2 - page 36, column 1, paragraph 3 abstract -----	1-18, 20, 46-59, 68-81
X	WASHBURN, K. E., ET AL.: "the use of phenothiazine dyes to inactivate bovine viral diarrhea virus in goat colostrum" CANADIAN JOURNAL OF VETERINARY RESEARCH., vol. 68, 2004, pages 105-111, XP002526892 CANADIAN VETERINARY MEDICAL ASSOCIATION, OTTAWA the whole document -----	1-18, 20, 46-59, 68-81
	-/--	

INTERNATIONAL SEARCH REPORT

International application No

PCT/DK2009/050016

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ABRAHAM R ET AL: "The influence of periodate oxidation on monoclonal antibody avidity and immunoreactivity" 1 January 1991 (1991-01-01), JOURNAL OF IMMUNOLOGICAL METHODS, ELSEVIER SCIENCE PUBLISHERS B.V., AMSTERDAM, NL, PAGE(S) 77 - 86 , XP023987595 ISSN: 0022-1759 [retrieved on 1991-01-01] page 79, column 1 - column 2; table 4 -----	22-81
X	US 2004/185040 A1 (GARCIA-MARTINEZ LEON FERNANDO [US] ET AL) 23 September 2004 (2004-09-23) example 7 -----	22-28, 45-81
X	LAWTON. A. R., AND MAGE, R. G.: "The synthesis of secretory IgA in the rabbit. I. Evidence for synthesis as an 11 S dimer" JOURNAL OF IMMUNOLOGY, vol. 102, no. 3, 1969, pages 693-697, XP002538371 American Association of Immunologists ISSN: 0022-1767 -----	22-81
A	EP 0 417 821 A (DUPHAR INT RES [NL]) 20 March 1991 (1991-03-20) example 1 -----	18,20, 46-59, 68-81
A	EP 1 004 323 A (BAXTER AG [AT]) 31 May 2000 (2000-05-31) paragraphs [0004], [0005], [0027], [0038]; examples 1,2 -----	1-18,20, 46-59, 68-81
A	US 2003/012779 A1 (GRIEB TERI [US] ET AL GRIEB TERI [US] ET AL) 16 January 2003 (2003-01-16) paragraph [0055]; examples 1-15 -----	1-18,20, 46-59, 68-81
A	CA 1 210 329 A1 (CANADA MAJESTY IN RIGHT OF) 26 August 1986 (1986-08-26) the whole document -----	18,20, 46-59, 68-81
A	EP 0 269 405 A (CONNAUGHT LAB [CA]) 1 June 1988 (1988-06-01) the whole document -----	18,20, 46-59, 68-81
	----- -/--	

INTERNATIONAL SEARCH REPORT

International application No

PCT/DK2009/050016

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98/03550 A (CSL LTD [AU]; BERTOLINI JOSEPH [AU]; COPPOLA GERMANO [AU]; DAVIES JEFF) 29 January 1998 (1998-01-29) page 4, paragraph 3; examples 1-8 -----	18,20, 46-59, 68-81
A	WO 97/35490 A (TRACE SCIENT LTD [AU]; SMITH LANCE WILLIAM [AU]) 2 October 1997 (1997-10-02) the whole document -----	18,20, 46-59, 68-81
A	WAINWRIGHT, M.: "methylene blue derivatives - suitable photoantimicrobials for blood product disinfection" INTERNATIONAL JOURNAL OF ANTIMICROBIAL AGENTS, vol. 16, 2000, pages 381-394, XP002526893 Elsevier Science the whole document -----	1-18
A	MEHRA, R., ET AL: "Milk immunoglobulins for health promotion" INTERNATIONAL DAIRY JOURNAL, vol. 16, 2006, pages 1262-1271, XP002526994 GBELSEVIER APPLIED SCIENCE, BARKING, the whole document -----	18,20, 46-59, 68-81
A	US 5 198 213 A (STOTT GERALD H [US] ET AL) 30 March 1993 (1993-03-30) the whole document -----	22-81

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2009/050016

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-21(completely); 45-59, 68-81(partially)

A method of producing as germ free composition by mixing colostrum or derivatives with a disinfectant dye

2. claims: 22-44, 60-67(completely); 46-59, 68-81(partially)

A method for producing a multimerized immunoglobulin by multimerizing an immunoglobulin

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/DK2009/050016

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5147548	A	15-09-1992	AT 112937 T DE 4026365 A1 EP 0471890 A1 JP 6121637 A	15-11-1994 27-02-1992 26-02-1992 06-05-1994
US 2004185040	A1	23-09-2004	US 2008299122 A1	04-12-2008
EP 0417821	A	20-03-1991	CA 2024959 A1 HU 61162 A2 IE 903276 A1 JP 3237358 A US 5143848 A	14-03-1991 28-12-1992 10-04-1991 23-10-1991 01-09-1992
EP 1004323	A	31-05-2000	SI 988063 T1	31-12-2002
US 2003012779	A1	16-01-2003	CA 2450730 A1 CN 1541110 A EP 1425041 A2 JP 2005517631 T MX PA03011617 A WO 02103029 A2 US 2004249135 A1	27-12-2002 27-10-2004 09-06-2004 16-06-2005 28-08-2006 27-12-2002 09-12-2004
CA 1210329	A1	26-08-1986	NONE	
EP 0269405	A	01-06-1988	AU 596714 B2 AU 8168187 A BR 8706374 A CA 1302884 C CN 87101294 A DE 3781104 D1 DE 3781104 T2 ES 2033880 T3 GR 3005451 T3 JP 1085929 A JP 1749314 C JP 4038730 B MX 168854 B RU 2008916 C1 US 4849508 A ZA 8708815 A	10-05-1990 26-05-1988 19-07-1988 09-06-1992 06-07-1988 17-09-1992 17-12-1992 01-04-1993 24-05-1993 30-03-1989 08-04-1993 25-06-1992 11-06-1993 15-03-1994 18-07-1989 24-05-1988
WO 9803550	A	29-01-1998	CA 2261291 A1 EP 0954534 A1 JP 2000515857 T	29-01-1998 10-11-1999 28-11-2000
WO 9735490	A	02-10-1997	CA 2250211 A1 NZ 332151 A	02-10-1997 29-06-1999
US 5198213	A	30-03-1993	NONE	